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AGRICULTURAL NOTES

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COFFEE VARIETIES

By T. B. McClelland

The question of what variety of coffee to plant did not present itself to the early Porto Rican coffee growers for there was but one available. Fortunately this was an Arabian variety of excellent quality. Today the coffee plantations of Porto Rico are quite uniform as to variety, the differences in the product being the result of conditions of location rather than to inherent differences within the plant.

In more recent years explorers in Africa have found many other species of the genus Coffea differing in one respect or another from the Coffea arabica familiar to us in the Porto Rican coffee. Some of these are of promise, some not. In addition to these new species variations from the typical Arabian coffee have appeared in plantations in different parts of the world which have reproduced their variant character in their seedlings. A number of these have been imported by the Federal Station. The result is that at present the planter has many sorts from which to choose in making a new plantation or replanting an old one.

The Dutch East Indies have long been famous for their coffee. In the United States the term Java in relation to coffee has implied excellence of cup quality. This will not remain true in the future. In the last quarter century the Javan plantations have been almost wholly replanted to inferior sorts. Robusta coffee has largely supplanted the Arabian. The former has proved in Java of vigorous growth, productive and more disease resistant than the Arabian. The Javan planters have been forced to its use by the presence in their plantations of a leaf disease fortunately not found in Porto Rico.

There are a number of varieties of Robusta coffee and closely related sorts. At Mayaguez these have been under test for some years. The Federal Station strongly advises against commercial plantings of Robusta coffee, since the quality of the beverage prepared from it is very poor. The replacement of a high grade coffee by one much inferior to it in quality and appearance of bean would be a mistake.

In some sections of Porto Rico the foliage of the coffee trees is in large part destroyed by the larva of a small moth. ~~This tiny white worm feeds within the tissue of the leaf while leaving a protective layer above and below, protecting it against both poisons and contact insecticides.~~ As the coffee tree is evergreen, it works at all seasons. If Arabian coffee is grown, the planter must rely on parasites to combat this pest. He, however, possesses one effective means of fighting this insect. There are certain coffees with leaves of much coarser and heavier texture than the Arabian and though the leaf miner is able to penetrate such a leaf he makes but slight headway and does little damage. The planting of such coffees is an effective means of combating the leaf miner. In localities where the leaf miner works so extensively as to greatly reduce the production of Arabian coffee, the planting of a resistant variety should be considered.

Of the coffees of heavy leaf texture Coffea excelsa seems the most promising of those tested up to the present. The tree is of vigorous growth, handsome in appearance, and productive. Its large size necessitates wide spacing and the trees must be topped to facilitate picking the crop. A spacing of 12 feet each way is recommended and the trees should not be allowed to exceed 12 feet in height. Even so ladders are required for picking the crop.

The ripening season is wholly different from that of the Arabian coffees and extends from late winter into June. It thus fits in well with off season for labor on the Porto Rican coffee plantation. Pickings may be made at monthly intervals as the ripe fruit does not drop from the branch. An almud (20 dm. 3.) of cherries gives but 4 pounds of coffee beans after removal of the parchment, in contrast to 5 pounds of the Porto Rican coffee. The bean is not as attractive in appearance as the Arabian and the two should not be mixed for marketing. The cup quality of the beverage is good.

Maragogipe is a variety of striking appearance. The cherries and beans are the largest among the Arabian varieties, the bean being 70 per cent heavier than the Porto Rican. The cup quality is considered excellent and the flavor distinctive. In the Mayaguez plantings, however, this variety has proved a light bearer, which is in agreement with its reputation elsewhere. On account of its low production it is not recommended for general planting.

In contrast to the large size of the Maragogipe variety the Mocha bean weighs only about one-third as much. In general appearance the tree differs noticeably from the typical Arabian owing to the shortness of many of the internodes and the much smaller foliage and fruit. The quality in the cup is excellent but this variety is not recommended for commercial planting for several reasons. The production is light, the collection costly due to the small size of the cherry, and the price on the local market would be low because of the diminutive size of the bean.

A coffee of somewhat larger bean size, though smaller than the Porto Rican, is

San Ramón. This is supposed to have originated in Central America. The tree is vigorous but of dwarf habit. A representative tree is quite dwarf with very short internodes resulting in a compact form. The small size allows closer planting than would be advisable for typical Arabian. This variety comes into production while very young, numerous trees producing at less than three years from planting the seed. While the individual yield is small in comparison with other varieties it is large in proportion to the size of the tree. In comparative data assembled on a number of different varieties of Arabian coffee San Ramón gave the highest yield of beans per almud, 5 lbs. 11 oz. after removal of parchment, the latter process entailing a loss of but 15 per cent in weight. This coffee is recommended for planting in locations where the exposure to winds makes the site less suitable for the typical Arabian coffee.

Seed of Columnaris coffee was imported from Java where the original tree, presumably a sport, was discovered on his estate by a Javan planter. This variety has proved much more vigorous than the Porto Rican coffee. The trunk is stiff, straight and tall. The primary lateral branches are very long, some even reaching a length of 8 feet or more and on these many secondary branches are produced. Many of these branches sweep the ground and so make a solid column of foliage from the ground up. After some years as some of the lower laterals are lost and the tall straight trunk bends under a heavy crop with the consequent production of new uprights upon it, the column-like effect which gives distinction and beauty to the younger trees is lessened. The tree is later in reaching maturity and the crop ripens later in the season than the typical Arabian. As much as six years may elapse between planting the seed and harvesting the first crop, but subsequent production should be satisfactory. The bean is of good size and indistinguishable in appearance from the Porto Rican. Because of its vigorous growth, its record for productivity in the Mayaguez plantings, and appearance of bean and cup quality this variety is recommended.

The coffee known as Erecta is another variety received from Java which has made a good performance record. The growth is vigorous and the production satisfactory. The bean resembles the Porto Rican in size and appearance.

Padang coffee is a Sumatran variety highly thought of by the trade. In general appearance of tree and bean it is similar to the Porto Rican. However, the bean is somewhat larger than the Porto Rican, and the loss in preparation of cherry coffee is greater. This variety has proved very productive under favorable conditions and is recommended for planting.

Bourbon coffee is a variety widely grown in Brazil and highly esteemed. In the test plats planted to it at Mayaguez the trees have grown well, are handsome in appearance, and satisfactory in production. In samples compared the loss in weight incident to processing from cherry to cleaned bean was greater for Bourbon than for Porto Rican, and the bean size of the former was smaller, both points of disadvantage. In marketing Bourbon may be mixed with the Porto Rican.

Additional and more detailed information about these and other imported coffee varieties is to be found in Bul. No. 30 of the Federal Experiment Station and plantings of the different coffee varieties are to be seen at the Station at Mayaguez. Those wishing seed should write to the Station on October or November at which time seed of most varieties is available.

FERTILIZERS FOR COFFEE

The recent high prices received for coffee have greatly stimulated the flagging interest in this once prosperous crop. Plantations are receiving renewed attention, and the beginnings of a more general air of prosperity are to be seen in the coffee sections of the island.

Coffee planters are interested in means of increasing production. One phase of this interest is indicated by inquiries as to what fertilizers should be used to this end. Such inquiries are also received from time to time by local agricultural investigators.

This problem has been under investigation by the Federal Agricultural Experiment Station at Mayaguez for some years. The results of this work are now nearly ready for publication.

It has been demonstrated that the application of suitable chemical fertilizers will result in a largely increased coffee production. This however does not necessarily mean that the coffee planter who applies fertilizer to his coffee will be in a better financial condition at the end of the year for having done so. With coffee selling at a sufficiently high figure, as at present, the increased production due to the use of fertilizers may justify the expenditure, but with coffee at a low price, the cost of the fertilization may easily exceed the net value of the increased production.

Coffee soils differ and so a fertilizer combination which may prove entirely satisfactory for one soil may be inadequate for another. In one group of 40 experimental plats the application of nitrogen and potash to the soil appeared wholly sufficient and no improvement in growth or production could be attributed to the addition of phosphoric acid. In another set of plats located within a mile's distance of the former, all three constituents, nitrogen, phosphoric acid and potash were required to produce the maximum yield.

The need for potash has been notable. Of the three fertilizers tested, potash has appeared the most important factor. Nitrogen is highly beneficial, also, and phosphoric acid may or may not be needed.

For those who wish to test the effect of fertilizers on their coffee it is sug-

gested that ammonium sulphate and potassium sulphate be mixed in equal proportions by weight and the combination applied at the rate of 300 pounds per acre. For some locations this may prove adequate. But in connection with this plat, another plat as nearly as possible like the first in condition of trees, location and soil, should be given phosphoric acid in addition. For this plat high grade phosphoric acid, ammonium sulphate and potassium sulphate may be mixed in equal parts by weight and application made at the rate of 450 pounds to the acre. Or each tree may be given 1/2 pound of the former mixture or 3/4 pound of the latter as the case may be. The practice followed in the experiments conducted by the Station has been to make one application in late May or early June and another soon after the crop has been collected, in December.

The fertilizer should be well distributed over the range of the coffee roots and incorporated with the surface soil, a broad distribution facilitating the appropriation of the fertilizer to the use of the tree.

COFFEE ROOT DISEASES

By C. M. Tucker

Many coffee plantations in Porto Rico are losing trees each year by attacks of fungi which live in the soil, growing through it from one tree to another. The trees usually die in a well-defined area, in which not a living tree remains. Such an area becomes larger year by year as the fungus attacks the healthy trees around its margin. The disease is first apparent from the wilting, yellowing and falling of the foliage, usually beginning on the lower branches. These symptoms are caused by the cutting off of the water and food supply of the tree by the destruction of the roots and the base of the trunk by fungi.

In Porto Rico there are two types of root diseases. They are known as black root disease and white root disease, depending upon the color of the fungus which appears at the base of the trunk and on the roots. The symptoms are the same in each type and both are fatal. The black root disease has been studied by Mr. G. L. Fawcett, formerly plant pathologist at this Station. The fungus causing the black type attacks also some other plants commonly found growing among the coffee trees, especially ananás and young guamá trees. Little is known regarding the white root disease which is quite destructive in this section.

Since the progress of the root-destroying fungi through the soil is slow, the loss of trees by root disease is gradual, and the disease does not attract as much attention as would a more conspicuous and rapidly spreading disease, although the latter might cause much less loss. The general distribution of the root diseases over the Island indicates that the aggregate number of trees killed by them is very large. It is very possible that root diseases may be one of the greatest problems of the coffee producers.

The purpose of this article is to call the attention of the growers to the fact that this Station has begun investigations on the coffee root diseases, and to ask for their cooperation to the extent of sending us the information they have obtained on their plantations; we would like reports regarding the severity of the disease as indicated by the number of trees killed and the rate of spread of the disease; the kind of root disease, white or black; the presence of root disease on other plants among the coffee trees; any observations that may have been made as to the special susceptibility or resistance of different varieties of coffee, or of the same variety when grown under different soil or meteorological conditions.

The Station will be very glad to receive diseased material. The most valuable material for our study is of recently diseased trees. The diseased tree should be cut off a few inches above the ground when the leaves are turning yellow and falling. The stump with six inches to one foot of the large roots attached should be dug out and allowed to dry slightly to prevent the growth of molds. The stump and roots should then be wrapped and addressed to the Plant Pathologist, P. R. Agr. Exp. Station, Mayaguez, P. R. Franks will be gladly sent to any one who will be kind enough to send us material.

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OFFICE OF FARM MANAGEMENT, FEDERAL BUILDING, SAN JUAN

-- SOME PINEAPPLE PROBLEMS. --
By Henry C. Henricksen.

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